SECTION 10: FLOOD HAZARD EVALUATION

A. General. Land subject to being flooded by a flood of one hundred (100) year frequency as defined by Title 76, Chapter 5, MCA, or land deemed to be subject to flooding by the Commission, shall not be subdivided for building or residential purposes, or other uses that may increase or aggravate flood hazards to life, health or welfare, or that may be prohibited by state or local floodplain or floodway regulations. Land deemed to be subject to flooding by the Commission may include (but is not limited to) land subject to 100-year flooding, 500-year flooding, shallow flooding, groundwater rise, historically flooded lands and lands located in proximity to a water course.

B. Intent. The intent of a flood hazard evaluation is to assess all possible flooding hazards to a subdivision. Part of this evaluation must therefore addresse the uncertainty of predicted conditions during significant meteorlogic, geologic and hydrologic events, and the evaluation draws upon known and observed flood behaviors and dynamics for context. The regulatory flood maps and associated flood studies recognized by Gallatin County may contain some of this information but do not address the full range of hazards and flooding conditions necessary for a Flood Hazard Evaluation.

C. Procedure.

1. If any portion of a proposed subdivision is within a flood zone as designated by a FEMA Flood Insurance Rate Map, a FEMA Floodway Map, or a County-approved flood study, a Flood Hazard Evaluation as outlined in Subsection D below shall be submitted.

2. If any portion of a proposed subdivision is within two thousand (2,000) horizontal feet and less than twenty (20) vertical feet of a watercourse draining an area of five (5) square miles or more, and no official floodplain or floodway delineation (study) of the stream have been made, or when a base flood elevation is contested, a Flood Study (as outlined in Appendix G) consisting of a full engineering analysis to determine the base flood elevation and a Flood Hazard Evaluation (outlined in Subsection D below) shall be required. A licensed professional engineer experienced in this field of work must submit a stamped letter attesting to the accuracy and integrity of the flood study.

3. <u>Submission of Report:</u> Three copies of the required Flood Hazard Evaluation and the model's digital files shall be submitted at the time of preliminary plat application. This information may be submitted, upon the request of the Commission, to the Floodplain Management Section, Water Resources Division, Department of Natural Resources and Conservation

(DNRC) for review and concurrence. If submitting a Flood Hazard Evaluation or flood study, the applicant will be required to pay for independent peer review by a licensed professional engineer or other qualified professional as approved by the County. Applicant may be required to pay for independent peer review of the Flood Hazard Evaluation if the County deems this necessary for reasons of technical complexity or if the applicant disputes County's findings. The independent peer review fees shall be assessed at the current rate established in the Gallatin County floodplain fee schedule.

D. Flood Hazard Evaluation. A Flood Hazard Evaluation is a professional assessment of all possible flooding hazards and a report of the risks associated with this potential flooding in the proposed subdivision. In addition to industry standard, one-dimensional, steady state water surface elevation modeling, a flood hazard evaluation includes:

1. A hydrologic analysis detailing: the derivation of the magnitude and frequency of the design flows utilized in the risk analysis (a discussion of the statistical and applicant's confidence in these estimates); the implications of simultaneous flood events on the design discharge, and verification that these estimates reflect the most recent recorded gage data and/or industry standard estimation methodologies.

2. An analysis and commentary regarding the accuracy of the existing regulatory maps to predict 100-year and 500-year floodplain boundaries with existing conditions upstream, on site and downstream of the project area or a new flood study proposed as the new regulatory map for the project area.

3. A discussion of overbank flow path uncertainty related to: rivers and stream channels that are topographically higher than surrounding floodplains, such as is common on the East and West Gallatin Rivers; shallow flooding channels; alluvial fan flooding; debris jams; ice jams and/or diversions and ditches.

4. A discussion of possible or predicted channel stability during flood events, including the possibility of channel avulsion and/or thalweg migration that could affect the flooding dynamics in the project area.

5. A discussion of the risk of landslides and/or debris flows occurring and affecting flood behavior in project area drainages.

6. An analysis of the stability and structural integrity of permitted and unpermitted floodplain fill in the vicinity of the project that contacts the regulatory 100-year floodplain, including rip rap, berms, levees, and other fill.

7. Identification and quantification of predicted overland flow and potential overland flow paths above and below the property under consideration.

8. A discussion of the project area's propensity to experience groundwater rise flooding.

9. Identification and quantification of predicted flooding from runoff over saturated and/or frozen ground.

10. A complete discussion of the stormwater runoff management practices and design criteria utilized to safely pass stormwater through the project without negatively affecting up- and downstream flood dynamics. This may include an analysis of runoff after projected buildout scenarios.

11. A discussion of risks associated with failures in upstream, downstream or on-site road, culvert, bridge and stormwater management infrastructure.

12. A statement attesting that all proposed sanitary sewer infrastructure meets 100-year flood design standards and/or will not otherwise contribute to water pollution during periods of flooding or high groundwater.

13. A discussion of irrigation ditches in the area and how they would affect the project should they fail, overtop or route surface runoff.

14. An identification of depressional areas (areas below the Base Flood Elevation or design flood elevation but unconnected to a separate and discrete flow path).

15. A discussion of risks associated with dam failures.

16. A discussion of potential changes in runoff or watershed hydrology that could affect the project.

17. A discussion of any flood hazard that the County feels is germane to the project.

E. Flood Hazard Evaluation Techniques. Acceptable methodologies for developing a Flood Hazard Evaluation include industry standard methods and those capable of satisfying professional peer review. These may include engineering, hydraulic, hydrologic, fluvial geomorphic, geotechnical, and risk analyses in addition to professionally qualified opinions and observations.

F. Waiver of Requirement. The Commission may waive this requirement where the subdivider contacts the Water Resources Division, DNRC, and that agency states in writing that data indicates that the proposed subdivision is not in the flood hazard

area as defined in this Section. In considering a waiver, the Commission shall consult with the Gallatin County Floodplain Administrator.

G. Subdivision of Land within a 100-year Delineated Floodplain. Where the 100-year floodplain has been delineated and mapped in a County approved study, the following standards shall apply to all proposed subdivisions:

1. No subdivision roads, bridges, utilities, or 100 % of a lot shall be located within the boundaries of the 100-year floodplain.

2. Land located within the 100-year floodplain boundary may be used for the following purposes:

   i. Open space.
   ii. Wildlife habitat.
   iii. Parkland.
   iv. Recreation.

H. Plat Map requirements. New developments within any land located in 100-year flood hazard areas designated by the regulatory study (FEMA or County-approved study) shall field survey the base flood elevation and show the limits on the plat map. Base flood data and flood hazard notes shall be shown on the plat or development document including but not limited to the elevation of the existing ground, flood water depth, lowest permissible floor elevations, and the boundary of the base flood and floodway through the subdivision.